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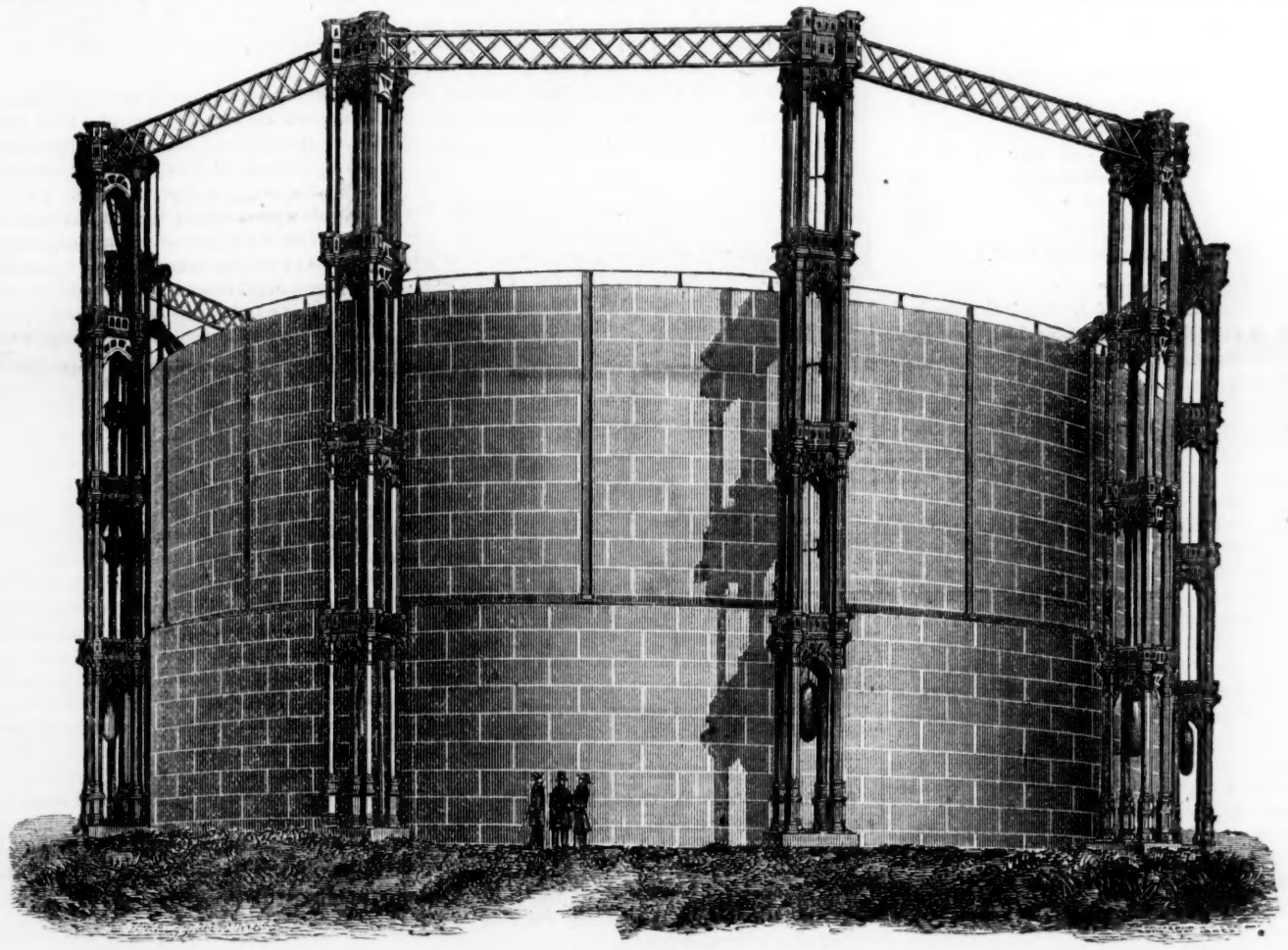

Telescopic Gas-Holder of the Newark Gas Light Company.

The accompanying cut represents gas holder No. 5, recently built for the Newark Gas-Light Company, by Messrs. Morris, Tasker & Co., of Philadelphia.

This holder is situated on a bluff above the Passaic River, and is exposed to the strong easterly gales that sweep over the Passaic and Hackensack meadows and strike the holders with great force. On this account the holder and guide frame were built especially strong. The following is a brief description of the work:

GENERAL SIZE OF HOLDER.

The outer section is 100 feet in diameter, the inner 98 feet 6 inches, and each section is 24 feet deep. The top is dome shaped, rising five feet in the center. The crown plate is of wrought iron four feet in diameter and a half-inch thick, and the sheets divergent therefrom run from No. 10, B. W. G., to No. 13 B. W. G., the outer row of plates riveted to the angle iron being No. 7, B. W. G. These plates are disposed in regular circles, the radial joints of each circle being intermediate between those joints of the circle next adjoining. The side plates of each section are of No. 14 B. W. G., except the upper row riveted on the angle iron curb, the row forming the cup, and the lowest row of the lower section, all of these are No. 9 B. W. G. The hydraulic cup is 15 inches deep and 6 inches wide, the bottom and top being formed of wrought iron channel beams, weighing 17½ pounds per foot. The top and bottom edges of the cup are stiffened with half round iron, weighing 5½ pounds per lineal foot. The roof frame consists of 20 principal and 40 secondary rafters. The principal rafters being formed from two pieces of five by three inch L iron bolted together, having an intermediate space to take the struts of the truss. This makes an excellent arrangement as there is no cutting, and consequent weakening of the rafters, as is the case in the ordinary T-iron rafter. The secondary rafters are made from three by three inch iron properly turned.

There is one circle of purlins made of 2½ by 2½ inch angle-iron. The 20 vertical ribs of the upper section consist of two pieces of three by three inch angle-iron, with a blade of wrought iron, nine by one half-inch, between, all being riveted together. These ribs are trussed and firmly secured to the sides and lower edge of the hydraulic cup. On the top of these ribs are the brackets formed of three-eighth inch iron for the bed plates of the guide wheels. On the outside of these

vertical ribs, and bolted to them, are the guide-bars—formed of six by one-half inch iron. The king post of wrought iron is of half-inch iron, 24 inches in diameter, the bottom end being a frustrum of a cone with a base of 33 inches, this frustum is made of cast iron, strengthened by wrought iron rings.

The guide rollers are of a most unique and complete kind all of them being adjustable.

GUIDE FRAME.

The guide-frame, which is remarkable for its strength and architectural proportions, is formed from cast and wrought iron so arranged as to give each metal its proper work.

This guide-frame was designed by Mr. P. Munzinger, the capable engineer connected with Messrs. Morris, Tasker & Co., and was accepted by Mr. Vanderpool the engineer of the Newark Gas-Light Company, in preference to his own plans and specifications, on account of its greater strength and graceful appearance.

This holder was erected in the summer and fall of 1871, and is as fine a specimen of this class of work as there is in existence. It reflects the greatest credit upon Messrs. Morris, Tasker & Co., and shows that not only do they furnish the best materials and employ the best men to erect their machinery, but that their work is done at very reasonable figure, and to the entire satisfaction of their customers.

The weights of the holder and frame are as follows:

Heighth of gas holders	216,000
" guide frame	295,000
" tank guider	23,040
" counter balance weights	20,000

The cost of the whole erected was about $38,000.

A Gas-Propelled Boat.

Mr. William A. Leggo, of Montreal, Canada, is the author of a novel method of propelling vessels, designed especially for canal boats, to overcome the difficulties of horse towage. He discards steam wheels, ropes and other common contrivances. All that Mr. Leggo uses is a large bent pipe which is attached to the stern of the vessel, the mouth of the pipe being placed under water, pointing stern-wise. The pipe rises to the deck, and at the upper end of the pipe is a gas light and valves that open inward for the admission of hydrogen gas and atmospheric air. As soon as enough hydrogen and air have entered, to wit, two parts of hydrogen to one of oxygen, the mixture takes fire from the gas light, an explosion ensues, the valves are closed, and the great pressure produced finds vent at the mouth of the pipe, acting against the water and driving the boat ahead. The valves then open again, the gases flow in, a new explosion takes place, and so on. These explosions follow with as much rapidity as the motions of a steam engine piston, and thus the boat soon acquires a regular velocity. Whether the manufacture, cost, and storage of the gas, and the working of the gaseous motor, will equal the economies and conveniences of steam power, and its propelling appurtenances, remains for Mr. Leggo to ascertain by trial.—*Scientific American.*

Gas and Water Matters in Egypt.

In Cairo, gas-pipes have been laid down in all the principal streets, and it is stated, on reliable authority, that these streets are better lighted than those of many European capitals. The principal thoroughfares are supplied with water mains, and good water is distributed throughout the city. New streets have been opened, and narrow ones widened. A beautiful artificial lake has been formed, and surrounded with iron railings, in a fashionable part of the city, which was formerly traversed by an offensive ditch, and which was a depository of garbage and rubbish. About the lake, and within the railing have been placed graveled walks, flower-beds, stands for bands of musicians, canopies for theatrical representations, and other entertainments, etc., etc.—*Am. Artisan.*

Chemical Repertory.

No. 98.—September 2, 1873.

EDITOR—HENRY WURTZ.

CHEMICAL EXCERPTS.

836. "Zopissa?"—The *Scientific American* instructs us as follows:

"F. R. asks: What is zopissa? Answer: Zopissa is the patent name of a patented compound in which we believe that pyroxylin or gun cotton is a prominent ingredient. In the opinion of the inventor, it is a marvellous substance."

As "Zopissa" is only one of the names of the *Dead Sea Asphaltum*, we must demur to our contemporary's belief;

837. Big Figures.—In Germany there are at present some twelve large manufactories of alizarine from coal-tar, and the product, which is rapidly increasing, is now 22,000 hundred weight per annum, valued at $2,000,000.

Germany also supplies the world with aniline colors.

838. Lightning and Gas-Pipes.—At Montclair, N. J., recently, the rods on a dwelling-house were struck by lightning and the fluid passed off into the ground, thence upon a gas-pipe near the terminal of the rod, to an air gas carbonizer, located a short distance from the house. The gas apparatus was blown up, but no other damage was done.—*Scientific American.*

839. Subcutaneous Carbolic Injections.—M. Declat, at a meeting of the Academy of Medicine (*Gazette Medicale*, Dec. 28), stated that, in cases of intermittent fever, he makes, on the first day of treatment, four subcutaneous injections of 100 drops of a one per cent. solution of carbolic acid; the next day three; the third day two. The first operation, says the author, always diminishes the fever, and sometimes cures it; the second is sometimes a work of precaution: and the third is so most always.—*Drug. Cir. and Chem. Gazette.*

840. Petroleum for Burning Bricks.—A burner is in use, in Canada, by which residuum of crude petroleum is used instead of coal or wood in brick kilns. By a simple contrivance the nozzle of the burner is made to throw the flame directly downward at the first firing, and after burning the head (as it is termed) this nozzle is replaced by a straight one, the change being effected in a few moments. The flame is thereby thrown into the arch any required distance, burning the whole kiln from one end, and doing it in much less time than by the old method.—*National Oil Journal.*

841. West Virginia Cannel.—We don't know whether we fully "take in the sense" of the following, from the *Engineering and Mining Journal*. To our readers it may be more diaphanous.

A genius who writes to one of the daily papers from West Virginia, says that that country will send cannel coal to New York next Winter, and retail it at $12 a ton, and, with that comforting prospect he presses the hand of the Metropolis with this kind assurance:

"New York may congratulate itself that the future periodical miners' strikes in Pennsylvania will be of little moment to Gotham, for New York, on a pinch, *can* burn bituminous coal. Anthracite will soon come down when it finds bituminous a fatal competitor." We are happy to say that, so far as can be told at present, the "combination" will have to wage the bitterest war against consumers for a long time before Cannel coal at $12 a ton can hope to be a rival to anthracite.

842. Oleoducts.—Or, we may coin a better word, while asking why a *Petrolioduct* may not come all the way to New York, and thus eliminate an enormously predominating portion of the expense of crude oil on the sea board. The *National Oil Journal* informs us that the length of the pipe lines for gathering in the oil to places of shipment on the Allegheny Valley Railroad, is surprising, and testifies to the extent and importance of the transactions in this direction. These lines are altogether six hundred and seventy five miles in length. Mutual and Union pipe lines at Parker and Foxburg, 250 miles; pipe lines on Oil Creek and Allegheny Valley River Railroad, 250 miles; lines from Butler county oil fields to Allegheny Valley Railroad, 125 miles; from Sandy and Beaver 30 miles; from Milton, 7 miles; from Franklin, 8 miles.

843. Ethylacetylene and its Identity with Crotonylene.—L. Pruner.—Ethylacetylene has been formed synthetically by Berthelot, who caused acetylene to act directly upon ethylene at a dull red heat. Crotonylene was discovered by Caventou, who removed two equivalents of hydrobromic acid from the bromide of butylene. The mixture of ethylene and acetylene was passed into bottles containing bromine. The bromised liquids, being left for two days in contact with a slight excess of bromide, are passed into tetrabromide, $C_8 H_6 Br_4$. On expelling the alcohol and crystallising, the compound thus obtained was found to agree in appearance, in properties, and especially in point of fusion with the tetrabromide of crotonoylene described by Caventou.—*Chem. News.*

844. Suffocation from Coal-Gas—Inhalation of Oxygen.—Three men had recently been brought to the City Hospital who had been nearly suffocated by inhaling coal-gas. A fourth occupant of the room, in which these men had slept, had died. Fresh air and stimulants were resorted to; but the most marked effects followed the administration of oxygen gas The inhalation of this agent was followed by an almost instantaneous improvement in the condition of the patients. This relief was followed at first by a relapse whenever the administration of the gas was discontinued. Soon, however, the improvement became permanent, and the patients were discharged well.—*Boston Medical and Surgical Jour.*

845. Safety at Sea.—The recent sudden destruction of two large passenger ships, the Atlantic and the City of Washington, has called attention to the desirability of availing ourselves of the means which modern science has placed at our command for the prevention of such disastrous accidents. For this purpose, each large passenger ship should carry a small, but powerful steamboat or launch, and in foggy weather this steam launch should be sent on ahead some few hundred yards, being connected with the passenger ship by a flexible telegraphic cable provided with an electric battery, so that signals or messages might be continually transmitted from one to the other. The steam launch should also carry an electric or other strong light, and be provided with a powerful steam whistle. On meeting with ice or with vessels, or unexpectedly approaching the coast, it would be comparatively easy to stop the steam launch and give warning in time to save the passenger ship from danger.—John Newlands, F.C.S.—*Chem. News.*

846. Another Australian Hydrocarbon.—On the banks of the Coorong, about six miles north of Salt Creek, South Australia, a remarkable petroleum district has been opened out. The country is said to be saturated with mineral oil, and around a shallow lake a strange deposit is found spread out upon the sand, which from its resemblance to india-rubber has been called caoutchouc, which yields upon distillation both gas and oil in large quantities. This peculiar substance, which has received in this country the provisional name of "coorongite," has been thought by some to be an elastic bitumen, and by others to be the mycelium of a fungus. Mr. T. U. Scrutton has, according to the *South Australian Register* of May 20, lately returned from the Coorong, and he reports most favorably of the locality not only for mineral oil but for coal.—*World.*

847. Effects of Air upon the Condensation of Steam.—The conclusions which Professor Osborne Reynolds draws from a series of experiments are as follows:

1. That a small quantity of air in steam does very much retard its condensation upon a cold surface; that, in fact, there is no limit to the rate at which pure steam will condense but the power of the surface to carry off the heat.

2. That the rate of condensation diminishes rapidly, and nearly uniformly as the pressure of air increases from two to ten per cent. that of the steam, and then less and less rapidly until thirty per cent. is reached, after which the rate of condensation remains nearly constant.

4. That in consequence of this effect of air the necessary size of a surface condenser for a steam engine increases very rapidly with the quantity of air allowed to be present within it.

5. That by mixing air with the steam before it is used, the condensation at the surface of a cylinder may be greatly diminished, and consequently the efficiency of the engine increased.

6. That the maximum effect, or nearly so, will be obtained when the pressure of the air is one tenth that of steam, or when about two cubic feet of air, at the pressure of the atmosphere and the temperature 60 F., are mixed with each pound of steam.—*Sci. American.*

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848. The Dose of Carbolic Acid.—Dr. W. G. Cotton, East Bethlehem, Washington Co., Pa.—The following case is of interest, as showing that we may yet be unacquainted with what should be the proper dose of carbolic acid in some instances. Mrs. Moffit, aged 70 was suffering from diarrhœa, for the relief of which she requested her husband to pour out twenty-four drops of laudanum. He by mistake gave her that amount of crude carbolic acid. It "burnt" the mucous membrane of her mouth and throat considerably, and produced a moderate amount of nervous prostration, which did not last long. She at once was aware there had been a mistake made, but thought the drug taken was "painkiller." In about an hour afterwards the discovery was made that carbolic acid had been taken, and milk was then freely used as antidote. The evil which resulted was immediate, but immaterial, and the good accomplished was the relief of the diarrhœa. I would not recommend twenty-four drops as a proper dose of this fluid, but have an idea that one drop is rather homœopathic.—*Med. Times*, June 21, 1873.

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849. Density of the World's Population.—The Memorial Diplomatique gives the following interesting account of the density of population in the great centers of humanity throughout the globe:

There are nine cities having a population exceeding 1,000,000 souls, viz.: London, 3,251,000; Soochow, 2,000,000; Paris, 1,825,000; Pekin, 1,648,000; Yeddo, 1,554,000; Canton, 1,236,000; Constantinople, 1,075,000; Sian-Tan, in the province of Human, 1,000,000, and Tchan-tchaon-foo, in the Province of Fokien, 1,000,000. It will be seen that, although London holds the first place, the Chinese Empire can still boast of possessing more populous cities than all the civilized states of the West. The number of cities possessing a population from above half a million up to a million is twelve, viz.:

New York, Vienna, Berlin, Hang-kaow, Philadelphia, St. Petersburg, Bombay, Calcutta, Fowchow, Tchehing, Bangkok and Kioto. Twenty cities have a population of from 300,000 to 400,000 inhabitants, 33 of from 200,000 to 300,000, and ninety of from 100,00 to 200,000 inhabitants. Europe alone possesses 171 cities containing more than 50,000 inhabitants, at the head of which stand London, Paris, Constantinople, Vienna, Berlin and St. Petersburg.—*Iron Age.*

Of the eight Corliss engines in the Vienna exhibition, two came from Switzerland, one from Belgium, two from Germany, and three from Austria.

British Association of Gas Managers.

Tuesday, June 10.

[Continued from page 60.]

But then, on the other hand, it must be borne in mind that it is at once our duty and our interest to study the interests of the consumer.

Our industry is of necessity a monopoly. We have entrusted to us the sole right of lighting a given area. Rights are conceded to us which, in the nature of the case, drive rivals from the field. These exclusive rights bring with them corresponding duties, and we are not to enjoy the one without caring for the other. And it is our interest as well as our duty to do this.

A monopoly may seem to override the common laws which regulate profit and loss in commercial transactions. But in the long run the principles of political economy prevail, and he who has had a monopoly conceded to him will find that he will work his monopoly most profitably by working it on the same principles as secure success to the manufacturer in the open market. If we attempt to take an unfair advantage of the public, we shall find that our profits are lessened rather than increased. Diminished consumption will follow an excessive price; inferior illuminating power will give occasion for the use of other methods of lighting. Impure gas will lead consumers to employ less injurious substitutes, and the right of monopoly abused will only punish the monopolists; whilst the fair and legitimate working of it would secure advantages to all parties. Hence it appears to me these our meetings ought to be specially occupied in discussing the best means of increasing the accommodation of the public, so far as the supply of gas is concerned. And it should be our study, in the first place, to furnish this in the most convenient manner; secondly, to render it of the greatest possible chemical purity; thirdly, of a high illuminating power; and lastly, at the lowest price consistent with a fair and reasonable dividend to the shareholders.

On each of these points I will offer a few remarks.

First, as to the general principle of seeking to accommodate the public as far as can be done. This principle should be kept prominently in view on various grounds, as being dictated not merely by prudence and self-interest, but also by justice and neighborly good feeling. Although the companies are, by Act of Parliament, furnished with power to lay down their mains and services to a large extent irrespective of the public convenience as to time, manner, and vested interest, yet it is very inexpedient that their engineers or contractors should use their power in an arbitrary manner, and it is also injurious to the progress and advantage of the companies themselves that such a course should be taken. Even the effort to accommodate the public in the simple matter of time may be attended with great mutual advantage. For example, by means of working by night instead of by day, the Great Central Company, the official analyst, Doctor Letheby, stated that he had never found more than 20 grains of sulphur per 100 feet of gas, and never more than six grains of ammonia to the same number of feet. Hence, in fixing the standard of purity for that company's gas, he gave the largest quantity which he had ever discovered in it as the maximum degree of impurity to be sanctioned. It is, therefore, deplorable to find that of late years the supply of gas which has been forced upon the City of London is so highly charged as it is with bisulphide of carbon. Whereas, by removing the ammonia and using the wet lime alone, or oxide of iron and wet lime unitedly, and drawing the retorts before the last dregs of gas have been extracted; or, in other words, by not insisting upon too large a produce of gas per ton of coals, no complaints such as have been so prevalent and troublesome of late need ever be made.

Then as to the illuminating power. To refer once more to the Great Central Company, it is well-known that my contract with it as engineer for the manufacture of its gas made an allowance of one halfpenny per 1,000 feet for each increase of one candle, from 10 to 16, and be it remembered not tested with a "London burner," but with the old "Dixon's Argand burner," the one which was referred to in the regulations laid down for instituting comparisons as to the standard candle.

Then as regards price. It is quite evident that this must depend upon many circumstances. It involves necessarily, and as a principal element, the capital expended in the construction of what ought to be useful works, and not wasted in mere embellishment, having reference also the cost of the wear and tear of the apparatus, the quantity of fuel for the necessary carbonization, the price and quality of the coals employed, the care and attention given to the other residual products, and the labor employed.

Allow me therefore, to suggest under this head that the members of this association be invited to prepare papers on the question, entering into all these particulars, which should also considered in their relations to the kind and description of retort used, to the mode of setting, to the size and construction of the gasholders for storeage, to the extent and nature of the buildings erected, the dimensions of the mains and services, the mode of purifying and condensing the gas, and the scale and position of the works. Each suggested improvement might, with much advantage, be illustrated by familiar examples, or by references to the writer's own experiences, both as regards failures and successes.

Undoubtedly the gas companies at the present time possess great power and influence, and are in a most prosperous condition. It will, however, be their true interest to use their influence with discretion and moderation. The supply and management of gas is but little understood by the general public, and it is the very nature of ignorance to be suspicious and apprehensive of exorbitant demands. Hence it is not to be expected that, at least to the same extent as in the supply of many other articles, the gas companies should reckon upon the entire approval of the general body of their consumers.

But inasmuch as a strong feeling exists in the public mind that some degree of competition in the gas supply is necessary to the common interest, and in order to prevent the inconveniences of monopoly, it will be the true policy of the companies to exercise great care lest any violent outburst of general dissatisfaction should be excited by undue charges, or the supply of gas of inferior quality.

Hence it is very desirable that the companies should be prepared at any time to prove that they have used their power with liberality and discretion. And it will be a most valuable service on the part of members of this association, to avail themselves of every mode and opportunity of bringing about such a condition of the various gas companies that whenever an investigation may be necessitated they may be able to give satisfactory evidence that they have neither taken undue advantage of their position nor put forth exorbitant demands.

I now give some account of a few of the inventions claiming attention, and also a short account of the papers now to be read, which has been furnished by your able secretary.

[We omit here quite a prolonged account given by Mr. Croll of the experiments lately made in London, with electric lights, which are of minor importance at present to us.—Ed.]

Eldridge on Coffey's Still.

The writer of this paper explains the construction and advocates the use of Coffey's still for the extraction of ammonia from gas, principally on account of its giving no pressure, and ensuring that the whole of the gas shall pass through a considerable quantity of water in the course of its ascent.

Warner's Paper on Distribution.

Assuming gas to be good and the manufacture economical, Mr. Warner points out that the satisfactory lighting of a town is dependent upon a perfect distribution, and as this cannot be accomplished without a thorough acquaintance with the machinery for the purpose, it is necessary that a perfect registration of the whole of the details should be made, and then again classified and tabulated for reference and comparison. To gas managers, it is said, a moment's reflection is not needed for it to be seen how close is the relationship between this subject, complaints, and unaccounted-for gas.

Parlby on Stopped Ascension-Pipes.

In this paper the cause of stopped pipes is attributed to high heats, allowing the charge to remain in longer than is necessary to drive off the gas, too deep a seal to the dip-pipes, irregularities or defects in the

casting of the ascension-pipes, and a hydraulic main of insufficient size to carry off the gas freely. The remedy is the avoidance of these errors, and taking care to charge the hottest retorts with a proportionately heavier charge, so that the whole may be worked off in the same time.

GREEN ON STOPPED PIPES.

Mr. Green, in his paper on stopped pipes, advises the use of a screen placed in the retort mouthpiece, between the ascension-pipe and the charge, as a remedy, and states the success that has attended his plan.

METHVEN ON COAL WASTED IN GAS-WORKS.

This paper points out how advisable it is to have a competent manager, and make him responsible for the coals consumed. The remarks are principally directed to very small works.

EMEESON ON UNACCOUNTED-FOR GAS.

The author considers it absolutely necessary to take a fair start in tracing the causes, and that due correction should be made for temperature, etc., when determining the amount of gas actually made, in comparison with that recorded by the station-meter, and attributes loss to a variety of causes, such as unsound gasholders, small and imperfect pipes and careless main-laying, unsuitability of joints for the ground in which the pipes are laid, chipping instead of drilling holes for services, want of provision for equalizing pressure in hilly districts, unregulated public lights, and want of attention to the keeping of their services in good repair, improper selection of meters to suit the particular place and circumstances under which it is placed, and neglect of a periodical inspection. The remedy is, of course, prompt and regular attention to all these points.

SKELTON'S PAPER ON GAS STREET-LIGHTING.

Mr. Skelton treats on the various forms of lanterns invented for utilizing as much as possible the rays of light which in the ordinary lamp, if not lost, are made but little use of, and divides the lanterns into three classes—radiating, refracting, and reflecting—and comes to the conclusion that the catoptric lamp, which is his own invention, is the best. He also notices the method of lighting by the rod, and an improved method of closing the bottom of the lamp.

HARTLEY'S PAPER ON COAL GAS AS A FUEL.

Mr. Hartley draws a direct comparison between the cost of gas and of solid fuel (coal) as a heating agent for steam-boilers, showing the great economy of coals on the large scale. He then makes a similar comparison in respect to cooking on a large scale, principally in respect to boiled or steamed food. Great waste of heat is shown to arise from the use of gas for merely boiling as compared with steaming food. Some consideration is given as to an open gas fire and to an open coal fire for boiling and roasting, and advocates the use of gas for roasting and baking under nearly all circumstances. He then enters upon the character of heating gas stoves, and divides them into simple cylinders, multiple cylinders, tubular stoves, reflector stoves, and stoves with solid heated materials. He advises the use of the latter in conjunction with a large radiating or conducting surface. He insists upon the ventilation of all heating stoves as indispensable, and concludes by showing the advantages of gas, in spite of its cost, for heating conservatories and similar places.

FRITH'S PAPER ON BOOK-KEEPING.

Mr. Frith in his paper explains the system of double entry, which he describes as one which is sometimes thought to involve double labor as well, but asserts that what is worth doing is worth doing well, and that in reality, especially where the manager acts as engineer, secretary, and other officers as well, the system he advocates is in the end far less troublesome and infinitely more correct and satisfactory than any modification or extension of the single-entry plan. He expresses surprise at hearing of a company with $370,000 capital working without a cash-book, and states that the imperfections or absence of system in the keeping of books and gas companies accounts that have come under his notice has induced him to lay before his brother managers what he considers to be a concise and simple plan.

GORE ON SUBSTITUTES FOR COAL IN THE MANUFACTURE OF GAS.

Treats upon the use of oils, resins, wood, mineral pitch, the decomposition of steam and its subsequent carburation, and the carburetting of air. He reviews the different apparatus and processes employed, and gives the result of his experience and observations in many towns on the continents of Europe and America, the conclusion being that there is no material or process superior to that generally employed in this kingdom.

JONES ON GASHOLDER CAPACITY COMPARED WITH CONSUMPTION.

From returns made to him from 153 gas-works he finds that the average is 89·77 per cent. in comparison with the maximum daily of consumption, and that the extremes range from 32 to 200 per cent.

DEMPSTER ON CHOICE OF MATERIALS AND CONSTRUCTION.

Relates to the selection of proper fire-clay for the uses to which it is applied, and refers to the construction of chimneys.

PATERSON ON FLOW OF GAS THROUGH PIPES.

This paper gives a brief history of the discovery of the laws which govern the flow of gas through pipes. The accuracy of the co-efficients from which the formula has been determined compared with the results of experiments made by the writer in 1872 on a 16-inch main. He considers that if any modern experiments seem to require a modification of the constant co-efficient 1359 to tally with the results, the probability is that inaccurate values have been attached to some of the data, and that with the exception of two slight errors he considers the article in "Clegg" as the most valuable elucidation of the subject which has yet appeared, and a safe and reliable guide in the hands of the gas engineer.

SUGG'S PAPER ON STANDARD BURNERS.

Mr. Sugg describes the first standard burner, and states Mr. Hughes's ideas thereupon, the principle laid down by him being that the burner which developed the illuminating power the least was the proper one for what he (Sugg) calls "adverse" testing. He then describes the Birmingham standard burner and its defects. The Leamington burner is treated in the same way, as also those for Dublin for 16-candle and for common gas. Consideration is given to the principle enunciated by Mr. Cardwell's committee—namely, that the companies had a right to demand the use of that burner which gives the best results in illuminating power, and is at the same time suitable for consumers in ordinary use. The result of this was the constructisn of the London burner and its adaptation to cannel gas. A description is also given of the Dublin cannel gas-burner and its defects, and reference is made to the gas referees standard cannel gas-burner. Mr. Sugg next examines the question from different points of view with regard to the employment of flat-flame burners for testing the illuminating power, and finally shows his views as to the requirements for a standard burner, and proposes to use a system of standard burners which would obviate the difficulty which arises from the present unsettled state of the question.

Petroleum Exports.

A SATISFACTORY EXHIBIT—INCREASED FOREIGN DEMAND—FAVORABLE PROSPECTS.

Among the most satisfactory indications of a speedy improvement in the condition of the oil market is the enormous increase in the exports of petroleum this season, as compared with any previous year. The following table of the quantity shipped from leading ports from January 1 to June 1 of 1872 and 1873 will show how greatly the foreign demand has augmented within a few months. The table is compiled from the last issue of the *New York Shipping and Commercial List*, the leading authority on all matters pertaining to shipments or imports from or to the United States. The exhibit is as follows, and a careful examination of the figures should be made by producers:

	Jan. 1 to June 1873.	Jan. 1 to June 1872.
From New York, gallons.....	46,224,596	27,706,330
" Boston.....	987,368	776,997
" Philadelphia.....	22,427,417	17,670,124
" Baltimore	1,221,438	271,561
Total Exports from the U. S.	70,869,799	36,425,012
Same time 1871.....		49,814,066
Same time 1870		41,802,634

In addition to the above, the exports from New York aggregated nearly three million gallons during the first three days of June, an increase of over twenty-seven million gallons since the first of January as compared with the same months of 1872. It is further noteworthy that regular exportations of large quantities are now made to regions heretofore non-consumers of petroleum or its products, and it is only reasonable to expect enlarged orders from these sources in the future. At this moment there are loading or to load at New York and Philadelphia vessels whose cargoes of refined oil will represent the total production of the entire petroleum districts for nearly two months. The coal famine in England is rapidly undermining the prejudices existing against kerosene as an illuminator, and the petroleum trade with that country is fast acquiring vast proportions as the result. Thus Liverpool imported 255,708 gallons last year, up to the 1st of June, against 1,150,877 this season; London, 353,433, against 1,741,551; Bristol, 136,534, against 781,852; and other ports in like proportion. The exports to Ireland have more than doubled; those to France quadrupled, and the demand from Germany, Belgium and other European countries is enormously increased.

These facts and figures are at once interesting and suggestive, indicating as they do in unmistakable terms an enhanced value for petroleum at no distant date. With so great an enlargement of the foreign demand, a production certainly no greater than the markets of the world require, the chances of its application in immense quantities to new purposes, and the continuous increase of home consumption, it is difficult to believe oil will not advance in price till it reaches a figure at which the average operator will be able to carry on his business, if not at a large profit, at least without positive loss, as has been the case in too many instances during the depression of the last few months.—*National Oil Journal.*

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last (July 31), Prof. J. D. Whitney in the chair. Messrs. David J. Staples, Solomon Goldsmith, Alfred Wheeler, R. H. Plummer, and Albert Williams, Jr., were elected resident members. Donations were received as follows: A full set of the publications of the State Geological Survey of California, presented by the State through Governor Booth. Specimens of fish sometimes called the "King of the Herrings," caught off the Farallone Islands, presented by Mr. C. P. Damaron. Mr. C. D. Gibbs presented the nest and eggs of marsh wren (*Troglodytes Pelustris*). These nests are abundant throughout the swamp lands; they are purse-shaped and composed of flexible grasses ingeniously woven together. They are suspended three or four feet from the ground attached to the tules by being woven around them. A small entrance is left near the top, and the nest is lined with soft grasses and down from the plant known as the "cat-tail." The eggs are of a light brown, mahogany color, with darker dashes varying in intensity of shade. Although Mr. Gibbs had seen many of the nests, this is the only one in which he had discovered eggs.

Dr. Blake presented to the Academy a specimen of *Pennatula*, which had been taken in the Gulf of Georgia, in about seven fathoms of water. A paper was read by W. A. Goodyear, of the State Geological Survey, on the "Situation and Altitude of Mount Whitney," the substance of which we will give in our next issue.

James R. Smedberg, Consulting Engineer of the San Francisco Gas Light Company, announced that the work entitled "A Synopsis of British Gas-Lighting," upon which he has been engaged for five years, is now in press, and will be issued in November. This new work is one which has been expected anxiously for some time by parties interested in the subject. It comprises the essence of the *London Journal of Gas Lighting*, from February 10, 1849, to December 31, 1868, with the monographs read before the British and North British Associations of Gas Managers between the latter date and November 1, 1873. There is added a zincograph of the latest form of that valuable American contribution to the art, the Sabbaton Multitubular Condenser. Part I. (700 pages and 170 illustrations) sets forth the whole argument of gas lighting. Part II. (250 pages and 35 illustrations) gives abstracts of 900 patents in this art and its allied industries. The whole work is quite a comprehensive one, and the illustrations, some of which were exhibited, are gotten up in excellent style.—*Mining and Scientific Press.*

A Quicksilver Mine is said to have been discovered in Iowa, near Rochester, on the Cedar River. The poisoning of cattle by licking salt from the earth led to the discovery.

Smedberg's "Synopsis of British Gas-Lighting."

The following is a list of subscribers to the above work, up to the present issue (August 16), making 279. Parties who have subscribed, but whose names do not appear in this list, will please notify us;

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Petroleum in Gas Making.

[The *National Oil Journrl*, in comment on the numerous efforts now in progress to perfect the petroleum-gas manufacture, makes some noteworthy remarks which we quote. Other remarks which it makes, however, as for example that "the use of coal in the manufacture of gas will very soon be abandoned" we leave out, this being a flagrant *non sequitur*, and imbued with the "*stat pro ratione voluntus*," to a very premature degree.]

"The progress of these experiments cannot be looked upon with indifference by the producers of petroleum, as it is undoubtedly from this very source that the first permanent relief from present low prices is to come. The supply of coal in England is becoming exhausted, the price already is advancing, and the demand for gas both for illuminating and heating purposes is increasing. What is now only a future contingency will very soon be a present necessity. This will open a new channel for the consumption of petroleum, and the quantity required will be immense. One great advantage which these new inventions have over the old modes is, that the buildings and machinery required cost so little that small towns, which have not heretofore been able to construct gas works, will find them within their means. But these inventions have, as yet, hardly reached a point where they can be said to be successful. There are many difficulties to be overcome, and it seems to us to be a subject worthy of the attention and the help of oil men. A reward of a handsome sum of money offered to the inventor of the best apparatus for manufacturing gas from petroleum, would stimulate experiment and study in that direction, and might lead to results which would be of great value to the oil-producing interest."

Parisian Gas.

The cost of lighting Paris makes a startling exhibit for small cities. The gas works at La Villette consume 720 tons of coal a day during the winter, and 330 tons throughout the summer months, and the price paid for coal by the company during the past year has been close upon $2,500,000. The consumption of gas has increased from 40,000,000 of cubic metres in 1855, and 116,000,000 in 1865, to close upon 150,000,000 for 1872, and the total length of the pipes laid down is rather more than 1000 English miles. The gas company pay the municipality a sum of $40,000 for the right of laying on the gas, and it is further obliged to bear the cost of repairs whenever the pipes have to be replaced, to say nothing of a tax of two centimes upon overy cubic metre of gas consumed. From this latter source, the city of Paris derived more than $500,000 during the last year, while, by the terms of another agreement, giving it a fixed share in the profits, its revenues from the gas company amounted to a total nearly three times as large. There are 750 lamp-lighters for the whole of Paris, who, so excellent is their organization, perform their lighting functions in forty minutes, while it takes them even less time to extinguish the lamps. As the distance of ground covered is little short of 950 miles, each man has to get over about 9,200 yards in forty minutes.—*Coal and Iron Record.*

Correspondence.

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—Ed.

[Some Facts About Naphtha.

National Coal Gas Company,
No. 4 Warren Street, New York,
August 13, 1873.

Mr Editor: Allow me to add some remarks to the letter of James H. Smith, Esq., Superintendent of the Newark Gas Light and Coke Company, of Newark, Ohio, published in your Journal of the 16th July, in regard to the use of naphtha not being successful, "in consequence of the filling up the small pipes with a resinous looking substance, which partially stops the flow of gas": and his inquiry, "has the mixture of atmosphere with the rich gas anything to do with it"?

All rich coals, as well as oils, have *carbon in excess*, which cannot be utilized in any other way than by the "Gwynne-Harris Hydrocarbon Process," owned by this company, which was so fully examined by Prof Silliman and yourself, as set forth in the able and elaborate report made of your investigations at Fair Haven, Conn., in 1868

In the old method of making gas from coals, this excess of carbon is worse than wasted. A large part of it attaches to the retorts in the form of solid carbon; other large portions pass off in the form of vapor, and condense in the mains, and in the pipes, all the way to the burners, filling them with gummy, resinnous, and other substances, which obstruct the flow of the gas. Hence the constant complaints of consumers, and the necessity of frequent attention to *the drips*. For these reasons, but a small per cent of rich coals can be used in the old or common process, and the consequence is—*poor gas*.

The gas from naphtha is *excessively rich*, and unless reduced (or used with a one foot burner, or an argand), will smoke like a tallow lamp. If air is added it forms a mere *mechanical mixture*. It increases the *volume*, but cannot, in any wise, aid in converting the vaporous substances into perfect gas, nor prevent condensation, nor produce perfect combustion. And air being of much greater specific gravity than gas, the tendency of each will be to *stratify*, as soon as nature has time to act.

But this is not the only difficulty arising from introducing air. Every per cent of air destroys, or puts out, the light of nearly one candle power of the gas, and yet *forty per cent.* of air will not sufficiently increase the volume of naphtha gas to prevent its smoking; but if more is added it will *blow*, and worse than all, the lack of proper combustion causes the unconsumed carbon to float about and settle in the form af *lampblack*, on everything in the room where that gas is burned.

All the difficulties above referred to are wholly obviated upon true, scientific principles, by our process. By the decomposition of superheated steam by our method, a large volume of gas is produced at a small cost, requiring neither scrubbing nor purifying, which readily seizes all carbonaceous substances in the retorts, mains, and pipes, arising from rich coals or oils, and having a much greater calorific intensity than coal or oil gas, produces *perfect combustion*, and a brilliant flame. Its perfect operation can be seen at the works of the Citizens Gas-Light Company of Brooklyn, where one bench of two double retorts and one single retort has been running since the 1st day of May last, producing over 50,000 cubic feet of gas per day, at a cost of *less than ten dollars*.

Its effect has been not only to increase the brilliancy of their whole product of gas, but it has thoroughly *cleaned out* their pipes throughout their entire district; and so completely prevented condensation that on a late inspection by their president and engineer, they found, as their president said, "*Nothing, or next to nothing in their drips.*"

This test in Brooklyn fully, and more, sustains all the scientific and practical results reported by Prof. Silliman and yourself, of your *five months* laborious and careful investigations, above referred to. The same process, in a slightly different form, has been in use in the Newburgh gas works, for nearly two years, with similar results.

The facts prove that all gas from coals or oils, lacks a proper per cent of hydrogen; and the only true, scientific, and practical method of producing gas, is by our process, and that wherever it is used, there will be neither stoppages of the pipes, nor condensation; and companies can, with 25 per cent. reduction in prices, furnish a better gas, at greater profit, than they have ever before done.

H. P. Allen, President

Petroleum-Gas.

Knoxville, Tenn., August 19, 1873.

Mr. Editor: Mr Folk's letter of inquiry in the last issue of the Journal touches a subject which is assuming great importance in the gas world just now—viz., the manufacture of gas from petroleum.

I could wish much if some of the fraternity who are, or have been actually engaged in the manufacture of gas from petroleum, would furnish us with a candid statement of the mode of manufacture and the commercial results.

I presume the cause of oscillation of Mr. Folk's lights, is the high specific gravity of petroleum gas. A gallon of petroleum contains by weight 85 per cent. of carbon and 15 per cent. of hydrogen, so that the gas must be very rich in carbon; and, therefore, the burners now used for coal gas are not suited for petroleum gas. Some I believe dilute this gas with atmospheric air, but this method must only make matters worse at the burner, by increasing the specific gravity and immensely reducing the illuminating power, so that I see no remedy for Mr. Folk, unless indeed that he introduces hydrogen into the retort by the superheated steam process, which would not only largely increase the yield per cubic feet per gallon, but would have the desired effect of giving a steady light, by reducing the specific gravity. But the "cost," the "cost." A far cheaper and more satisfactory method would be to go back to coal. I am now referring to small works. In large works I believe the day is not far distant when petroleum will be successfully used, especially as an enricher in place of cannel.

Now to change the subject. Will you be kind enough to state in your next issue (for it is interesting a number of your readers) if gas engineers and superintendents are excluded from membership in the Gas Light Association, supposing the companies they represent are not willing to join? Respectfully,

James Somerville.

Brooklyn's Plague Spot.

The French satirist has said that in the misfortunes of our best friends there is something not altogether displeasing to us, and those who justly fret at the neglect of hygiene in New York may find a certain consolation in the knowledge that a still profounder depth of pestiferiousness exists in Brooklyn, which is also called by courtesy a civilized city.

Along the dreary road which leads from Hamilton ferry to Greenwood Cemetery lies a panorama to sadden the sanitarian, and to alarm even the most ardent Malthusian. A district, many acres in extent, consisting of sunken lots, wherein the street embankments have dammed great lakes of stagnant water, covered with a thick green and yellow scum, swarms with the squalid denizens of thickly clustered hovels. By each foul pool are troops of sickly children dabbling in the festering slime, and drinking in disease with every breath. Everywhere filth reigns supreme and invites pestilence. The land, where land is seen, seems made almost wholly of putrescent organic refuse, and exhales horrible stenches, sickening to the mere passer-by, and even without the testimony of eye and nostril, the character of the place might be known from the advertisements of "ague-cures,"

"fever specifics," and other like nostrums with which shrewd quacks have covered every dead-wall in the the vicinity. It is in such hot beds as this that epidemics are nursed into full bearing and fevers flourish perennially: it is from hence that the seeds of death are distributed to other and richer neighborhoods; and, with some knowledge of that whereof we speak, we confidently assert our belief, that no where else throughout the civilized world can there be found a more grievous danger to public health than in the region which we have described.

If there be in Brooklyn any official sanitary authority, here is a vast and most important field for the exercise; if not, let us warn the wealthier classes of our sister city, that they cannot disregard the condition of their poorer neighbors without imperilling their own safety: and that if public action cannot be enforced, self-interest should prompt immediate private measures to drain, and cleanse, and saturate with disinfectants every square foot of a plague-spot, which threatens the entire community.— *World.*

The British Coal Committee.

The Select Committee of the House of Commons appointed to enquire into the question of the coal supply resumed its sittings at Westminster on June 15, when Mr. Andrew Landall, managing partner in the Lochgelly Iron and Coal Works, Fife, employing 750 men, gave the customary statistics that the men spent a great deal of idle time and much of their money in public houses, and stated that the advance of wages had preceded the rise in the price of coal. He contradicted Mr. M'Donald as to the earnings of the men between 1860 and 1864; they earned during that time double the amount mentioned. The men by working shorter hours, had practically restricted the output. The ventilation of the collieries had greatly improved; the men had thereby been greatly benefited in health, and he did not believe that the occupation was now prejudicial to health. He attributed the agitation amongst the men for shortened hours to the action of agitators, classing amongst those Mr, M'Donald, who, he considered, was a great deal too much looked up to. Less coal was now stocked than formerly, and the men did not care for keeping up stock, and were very chary as to the admission amongst them of fresh hands, from whom they even demanded £5 each, as entrance money, in all cases where they had not been colliers originally. A great many new houses had been built to attract colliers, who could not pay the rent for four roomed houses even when they were built.

Mr. Allan Gilmour, managing partner of the Burnbank, Ladyton, and Goutfoot Collieries in Ayrshire, attributed the short-time movement to to the influence of the trades-union leaders, and believed the men would not have taken such a course except under pressure. He was opposed to arbitration; he had not found it answer, inasmuch as the men adhered to the decisions so long as their wages were raised thereby, but would not abide by the decisions when the result was a reduction. His opinion was that each master should deal with his own men.

At the sitting of the committee on Thursday, Mr. M'Clough, buyer of coal for the admiralty in the north of England, said he never had the slightest difficulty in getting coals at the high prices which had been ruling. The Government got their coals cheaper than the ordinary public, because there was no risk of bad debts, the payment was prompt, and coal gained a certain character through being so purchased. Small coal had gone up from 11s. to 28s. per ton, and coke which used to be 20s. 6d., had gone up to 52s., house coal having gone up from 14s. 9d. to 27s. 6d. The first cause of the high price was the excessive demand, especially in the iron trade; and then, he was sorry to say, the men would not work. If they would exert themselves reasonably, they could easily double the quantity, and he thought that in the interest of the public they should do so. The Mines Regulation Act had sent up the price of coal by about 3s. per ton, but he could not say exactly in what way it produced that result.

Mr. Cory, of the London Coal Exchange, said that in the five months of the present year there was a falling-off in consumption of 185,000 tons in London allowing for the increase in population. A few coals were brought from Belgium, but their importation ceased on account of the inconvenience experienced at the Custom House. The coals used by the poorer classes were chiefly from Yorkshire and Derbyshire. He did not consider that last year had been an unusually prosperous one for the London coal merchant, whatever it might have been for the colliery proprietor, as the London coal merchants could always make more profit when coal was low than when it was high. The Yorkshire and Derbyshire coal was consumed much more rapidly than the best house coal, and therefore was the dearest in the end, so that being taken into consideration the poorer classes were buying the most extravagant kind of coal.

Mr. Cockerell, coal merchant, London, then gave evidence, and agreed with the last witness as to the most wasteful coal being bought by the poorer classes, who, he considered, would benefit themselves by combining to buy coal in large quantities from the merchants at a wholesale rate, and then distributing it. There was a class of retail coal merchants known as the "Forty Thieves," who advertised first-class coal at prices for which it could not be bought at the pit's mouth, and they not only substituted an inferior quality, but gave short weight besides. The highest price coal reached in London was 52s. per ton. He did not think the railway companies, if they had accommodation, would object to carry out a single truck of coal to London for a private individual, but with short accommodation they gave the preference to their largest and most regular customers. A large quantity of household coal was now used for gas purposes in London, and a tendency to high prices in the future might be inferred from that fact.

Mr. Dickson, Chairman of the Coal Traffic Society, having contradicted the report that there had been a combination of coal merchants to raise the price of coal in London.

The Committee adjourned to Monday.— *Iron.*

Farmer's Patent Hydraulic Main.

[Some errors having occurred in the following article, we herewith republish it.]

We present herewith wood cuts of an hydraulic main, invented by William Farmer, Architect and Engineer. Trinity Building, 111 Broadway, N. Y.

Fig 1 represents a front view; fig. 2 a top view; fig. 3 a section through line A B: M M M, the main chamber; C C C, projections or dip cups; D D D, dip pipes; F F F, flanges; O O O, outlets.

The advantages of this main are: Saving of material, less obstruction to the passage of the gas from dips to outlets, convenience of placing the outlet pipes at any desired point throughout the whole extent of main, saving of end pieces for outlets; seats for dip-pipes may be planed perfectly true and in line; dip-pipes can also be turned precisely to one length. These mains are placed on adjustable stands, and can be readily set the proper levels, at time when required. They have been erected in the Cincinnati, Laclede, San Francisco and Mobile Gas works and have given perfect satisfaction.

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[Reported Expressly for this Journal.]

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International—At Sydney, $2 50 in gold			— —
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Little Glace Bay—At Mines, 2 50 Gold			— —
Pennsylvania Coals.			
Penn Gas Coal—At Amboy	$8 50	@	0 00
Westmoreland—At Amboy	8 50	@	0 00
(In New York both the above coals $9 10)			
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American Gas Coal	8 50	@	0 00
Fairmont	8 50	@	0 00
Newburgh Orrel	8 50	@	0 00
Pinnickinick	8 50	@	8 75
Cloverhill of Virginia	6 75	@	7 00
McKenzie Compound Mixture			— —
American Cannel Coals.			
Peytona of West Virginia	$15 50	@	00 00
Darlington of Pennsylvania			— —
American Cannel	$14 00	@	00 00
Asphalts.			
Albertite of New Brunswick	$— 00	@	— 00
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Trinidad Bitumen	— —	@	14 50

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☞ All communications to be addressed to "THE EDITOR, No. 42 Pine Street, Room 18, New York.

TUESDAY, SEPTEMBER 2, 1873.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

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INDUS-TRIAL EXHIBITION OF THE AMERICAN INSTITUTE OF N. Y.

The Board of Managers of the 42nd Annual Exhibition of the American Institute, takes pleasure in announcing to the inventors and manufacturers of our country, that there will be held under its direction the usual autumnal exhibition of home industries, at the Exhibition Buildings on 2nd and 3rd Avenues and 63rd and 64th streets, on Wednesday the 10th of September, at noon, and will remain open each secular day from 9 A. M. to 10 P. M., finally closing on Saturday, November 15th., 1873. The managers state that the prospects of its complete success are thus far most flattering.

Many changes have been made in buildings, general arrangements and design of the exhibition, in medals, premiums and awards of merit, all of which the Board is satisfied will receive the approval of exhibitors.

Many novelties are already secured, among which will be displays of Silk Manufacturers of this country, and it is believed that a greater number of producing machines will be in daily operation than have ever before been seen at any one exhibition; thus by this interesting and exciting feature, the number of visitors will be greatly increased, and the benefits to be derived by exhibitors correspondingly augmented. It is their desire that this shall be an exhibition of advanced methods and processes.

The American Institute is beyond doubt the best medium for impartial competition, and its extensive exhibition buildings the best meeting place in our country for for both buyers and sellers.

The Board of Managers will endeavor to perfect, as heretofore, arrangements with all the prominent railway and other companies to return, freight free, all articles exhibited, the freight on which shall have been paid to New York, provided the same shall not have changed ownership, and are returned before the 29th of November, 1873.

For further particulars respecting admission of articles for exhibition, etc., etc., address "General Superintendent, American Institute, New York."

OBITUARY.

RICHARD MERRIFIELD.

Once more devolves upon us the painful duty of announciug to the profession the death of one of its most accomplished and gentlemauly members, in the person of Mr. Richard Merrifield.

He was born in Albany, on the 19th day of August, 1826, and at the time of his decease was consequently 47 years of age. His first connection with the gas-profession was made in the service of the Albany Gas-Light Company, where he was, shortly after his entrance, promoted to the responsible dual position of Secretary and Treasurer, which place he retained for a period of about seventeen years. During this time he was elected Alderman of one of the wards of that city; and, during his term of office, gave entire satisfaction to his constituents in the discharge of his duties, and became one of the most active and enterprising members of that body. Having severed his connection with the Albany Gas-Light Company, he entered into partnership with the late Jos. A. Sabbaton and Sylvester S. Battin, under the firm name of S. S. Battin & Co., which company was formed for the purpose of erecting gas works throughout the United States. The business of the new firm prospered exceedingly well, as can be attested by the numerous specimens of superb gas-architectry which have been erected under their immediate supervision. Upon the dissolution of this firm, Mr. Merrifield entered into the business of manufacturing gas-meters, having associated with him Mr. Samuel Down. After two years of decided success they laid plans for the extension of their business, the result of which was the formation of the present American Meter Company. Mr. Merrifield was elected Secretary and Treasurer of this company, which office he held for over five years, and up to the day of his death still retained a position as one of its Trustees.

Next we find him identified with the Manhattan Gas-Light company, of this City, filling therein the office of Assistant Vice President, remaining with them about three years. The last active responsible situation in which we find him is fulfiilling the office of President of the Peoples Gas-Light Company of Albany, having been unanimously elected by the stockholders, and justified their expectations in his usual able manner.

Thus has ended the life of one of the most active and zealous members of the Fraternity.

Though it cannot be said that he has contributed greatly to the development of gas-manufacture, by giving birth to new inventions, he has more than compensated for this by his superior executive ability and business accomplishments.

As a genial friend, fond husband, and loved father, his death has caused a void that will be deeply and sorrowfully felt by all who have known him in his domestic relations.

SMEDBERG'S "SYNOPSIS OF BRITISH GAS-LIGHTING."

We would call attention to a list of subscribers to the above work, on page 81. Those who have subscribed but whose names do not appear will please notify us, and the omission will be rectified, as every progress is being made to have the work ready by Nov. 15th.

Incrustation of Water Pipes.—The Boston fire insurance companies are now calling attention to the condition of the water pipes in that city. It seems that the water supply is greatly diminished by the incrustations formed on the inside of the iron pipes by the action of the water, so that a three-inch pipe that has been laid ten years becomes reduced to two inches, those of four inches to three, and the six-inch mains reduced to five and four inches. A pipe was recently taken up in Howard street through which one could not see, though water flowed slowly; and a pipe of three-inch bore was taken up in Beacon street, filled up solid with rust. Here is a chance, says the Boston *Advertiser*, for an inventor to discover some coating to render iron pipes proof against the action of water. In the suburbs cement pipes are used, but it is said that they are hardly strong enough to bear the pressure of the Cochituate water.—*N. Y. Times.*

Lighting Coal Mines with Gas.—A good deal of progress is just now being made in the apparatus for lighting mines with gas. Mes rs. Hutchinson Brothers, gas engineers, etc., of Barnsley, who have the sole agency of Messrs. Huntriss and Swinburn's patent steam gas exhaust and propeller, are now lighting many collieries with gas. Already the apparatus has been fixed at many collieries in South and West Yorkshire, as well as in the North of England coalfields. Some excellent testimonials have been received as to the efficient way in which the apparatus is performing its work. The jet can be applied to almost any depth, it being now in use 500 yards below the surface of the ground. A steam jet is used to draw gas into and force it down a pipe to the bottom of the mine.—*Iron.*

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Advertisements cannot be received later than November 1st. They will be inserted in the order of date of their reception.

All communications relating to the SYNOPSIS OF BRITISH GAS LIGHTING, must be addressed

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By order of the Committee.
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(Signed by the Mayor and every Member of the City Council.)

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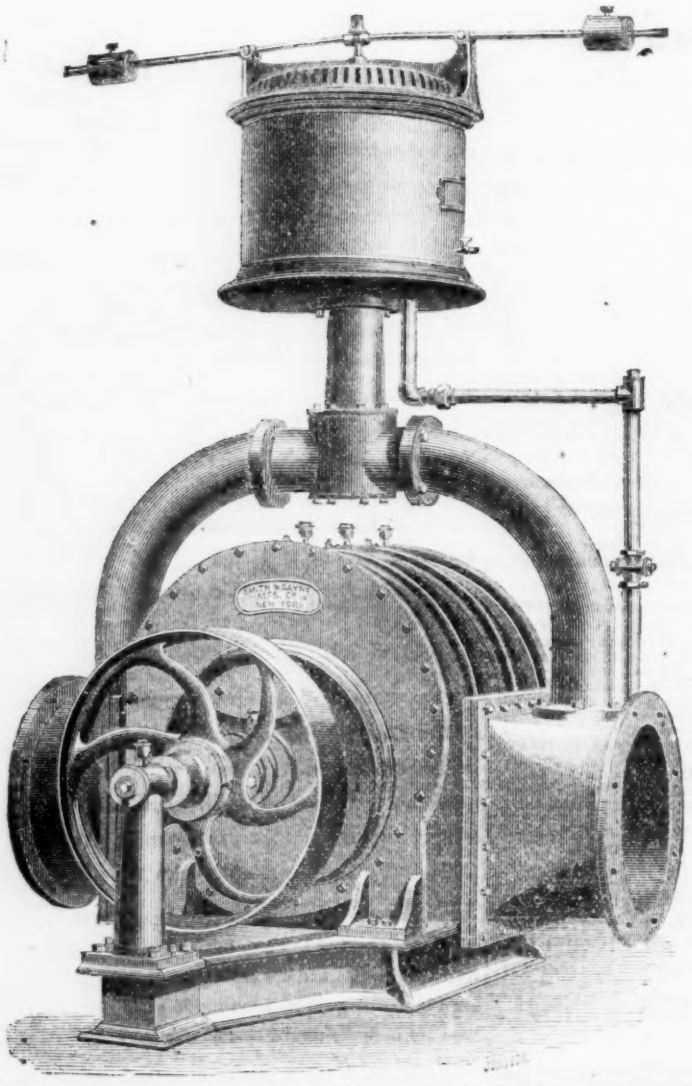
The Mackenzie Patent Gas Exhauster

And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-Joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER. PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan.

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GAS SCREEN MAN'F'G COMPANY.

TO GAS-LIGHT COMPANIES.

Your attention is respectfully called to the GAS SCREEN now being manufactured by the American Gas Screen Manufacturing Company, under the patents granted to E. DUFFEE, and are pleased to submit the following points of their excellence and superiority over all other screens now in use.

The Screen is made with an oak frame, interlaced with split rattan, drawn through holes at regular intervals in the Frame and cross-pieces, the edges of the frame being grooved prevent abrasion.

The advantages of the screen are:

1st. The large purifying surface, the construction of the Screen giving over three-fourths of the surface for the gas to penetrate the lime.

2d. On account of the free passage of the gas through the creen the pressure is reduced, thereby preventing the accumulating of carbon on the retorts.

The saving of lime and labor, as the Screens are not to clog, and are easily cleaned.

Their cheapness and simplicity of construction.

5th. Their DURABILITY—they can be used longer than any her now used.

Testimonials.

PROVIDENCE, RHODE ISLAND, March 21st, 1872

E. DUFFEE, Esq., Agent, etc.

Dear Sir: The Trays manufactured by you for our West Station were put in use in September last, and have *given perfect satisfaction.*

The frames are well put together, and I see no reason why ey will not last for a long time. The *very large amount of n space* in those Trays gives the gas an easy passage, and brings it into contact with the lime much better than when the space is so contracted, as is the case in most of the other Trays in use.

The pressure thrown upon the retorts by contracted passages is very great, and were gauges used more frequently than they now are in many gas-works, this facat of having *open Trays* would become more apparent to mangers of gas works. The digerence in pressure at this station in passing the gas through your purifiers, is two-tenths (2-10) inches.

The amount of gas purified, per bushel of lime used to this date, is six thousand five hundred and fifty six (6,556) cubic feet.

Respectfully yonrs,
JAMES H. ARMINGTON, Supt.

BOSTON GAS-LIGHT CO., Dec. 1871.

Dear Sir: In answer to your inquiry how we like your Patent Tray for dry gas purifiers, I take pleasure in saying we have used them exclusive of all others, for the last three years, and think them far ahead of any yet offered. The surface being nearly three times that of any other Tray, and their lightness and durability perfectly satisfactory.

Yours respedtfully,
A. M. GILES.

EDWARD DUFFEE, Esq.

EAST BOSTON, JUNE 15, 1871.

Gentlemen: We have used your Screens some five years. They give perfect satisfaction.

I consider them *by far the best Screen* for Dry Lime Purifiers I have seen. Yours truly, A. M. NORTON, Supt.

CHELSEA, May 1, 1871.

Mr. E. DUFFEE.

We are using your Purifying Trays, and find them to be the *best of any* that I have used, and will *purify more gas with less pressure* than any tray that I know. I can fully recommend them, after four years trial, to any Gas Superintendent with perfect safety, as the *cheapest and best Tray made.*

Yours truly, JOHN ANDREW, Sup't.

DORCHESTER, March 3. 1870.

Mr. E. DUFFEE.

Dear Sir: We have had your Gas Trays in constant use for almost one year and six months and find them superior to any others we have ever used, both in point of economy and efficiency. Truly yours, W. B. BROOKS,
Agent Dorchester Gas-Light Co.

JAMAICA PLAINS, MASS., June 21, 1871.

EDWARD DUFFEE, ESQ.

Dear Sir; The Trays ordered by this company three years ago, are getting somewhat worn. I wish to say here that I consider your Trays to be superior to any yet invented, therefore please make us another set at the price named, to be like the sample shown in every way, and oblige Yours truly
JAMES F. ROGERS,
Sup't Jamaica Plains Gas-Light Co.

BROOKLINE, June 11, 1871.

E. DUFFEE, ESQ.

Dear Sir: You will please make a set of Gas Trays for this company as soon as convenient, at price named. In regard to the merits of the Tray, after having them in constant use for over two years, I will say that I consider them *superior to any Tray* manufactured in this country. Respectfully yours,
H. A. ALLYN,
Sup't Brookline Gas-Light Co.

BANGOR, August 2, 1870.

EDWARD DUFFEE, ESQ.

Dear Sir: Yours of the 20th ult. is received. In regard to your Gas Trays, I take pleasure in saying that they have been in use over two years, and have given perfect satisfaction and they are in good order at the present time; should have no hesitation in recommending them, believing they are the most durable and easiest kept in order of any with which I am acquainted. Respectfully yours,
W. H. PERRY, Sup't.

OFFICE OF THE SPRINGFIELD GAS-LIGHT CO.
SPRINGFIELD, MASS., Oct. 10, 1871.

MR. WARD,
President Hartford Gas-Light Co.

Dear Sir: I have been using Gas Screens made by the American Gas Screen Company, for nearly a year, and find them superior in every way to the wooden Screens made and formerly used by the Springfield Gas-Light Co. I can purify more gas with the same quantity of lime, there being more surface to the Screens; and I consider them more durable, and recommend them to your consideration.

Yours with great respect,
GEORGE DWIGHT.

ROXBURY, June 14, 1872.

EDW. DUFFEE, ESQ.

Dear Sir: In answer to your inquiry regarding your Patent Gas Screens, I am happy to be able to say, that after nearly three years constant use we are perfectly satisfied with them being able to purify over fifty pet cent. more gas with them, than with any other Screen we have used.

Yours respectfully,
THOMAS J. PISHOU.

OFFICE DETROIT GAS-LIGHT CO.,
DETROIT, MICH., April 22, 1872.

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Yours truly,
P. E. DEMILL, Secretary.

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Amer. Gas Screen Man'f'g Co., Haverhill, Mass

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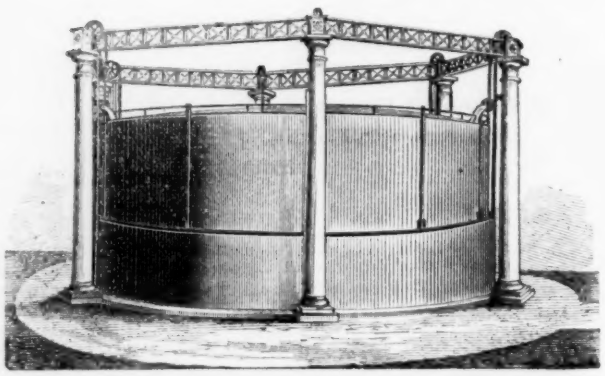

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JOHN P. KENNEDY, Chief Engineer.
LEONARD D. GALE, Consulting Chemist.

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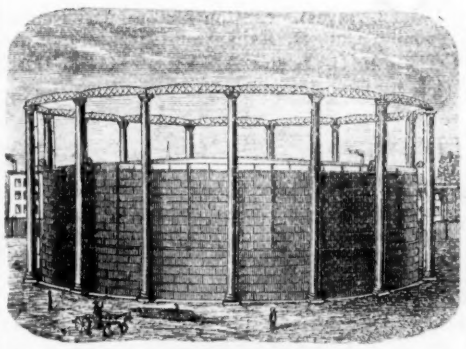

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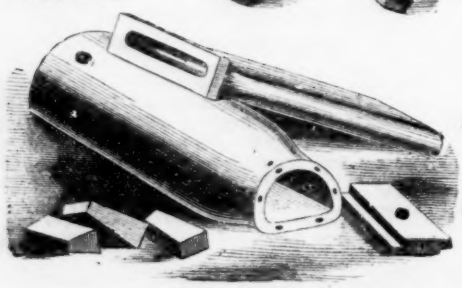

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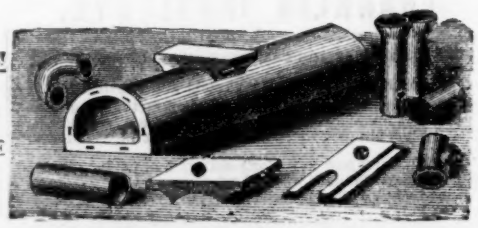

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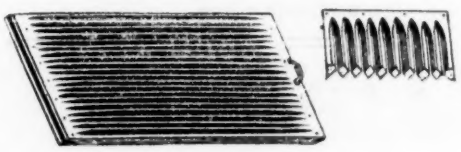

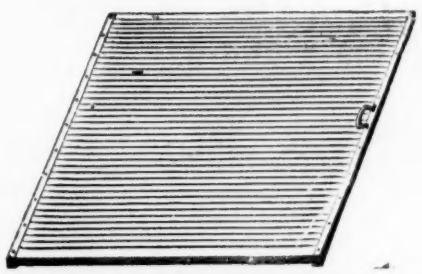

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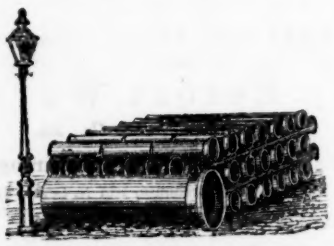

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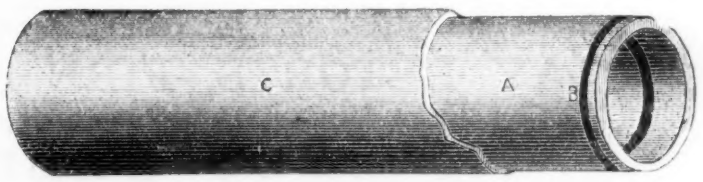

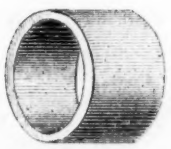

FIG. 2.

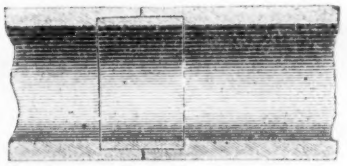

FIG. 3.

A—Cylinder of Wood. B—Band of Iron. C—Coating of Hydraulic or Asphaltum Cement.

FIG. 2.—Thimble for Connection. FIG. 3.—Horizontal Section and Connection.

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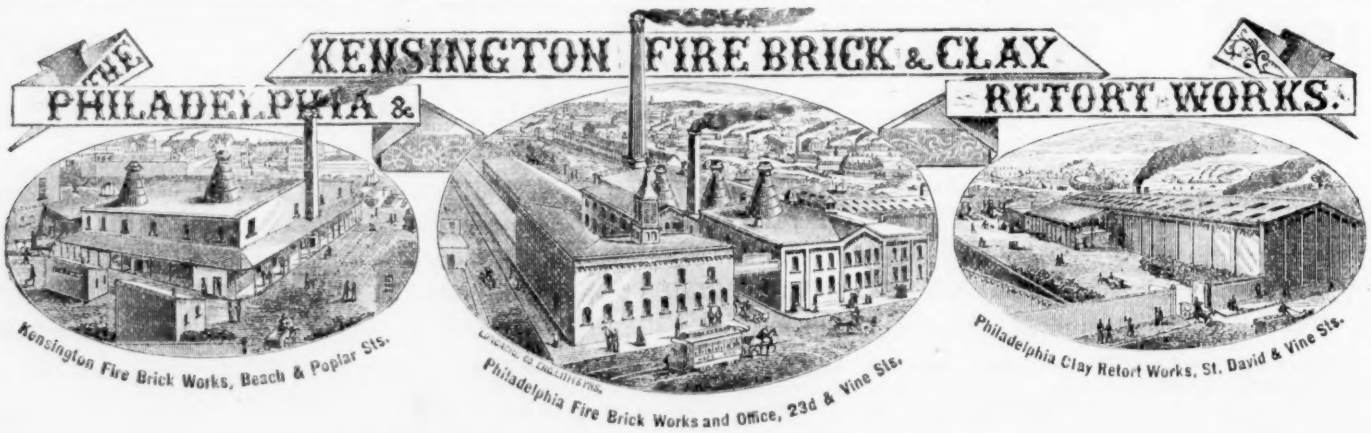
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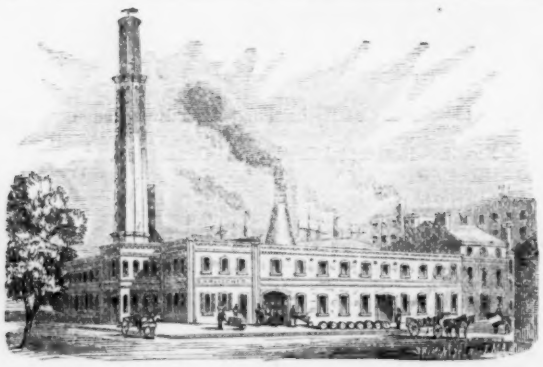

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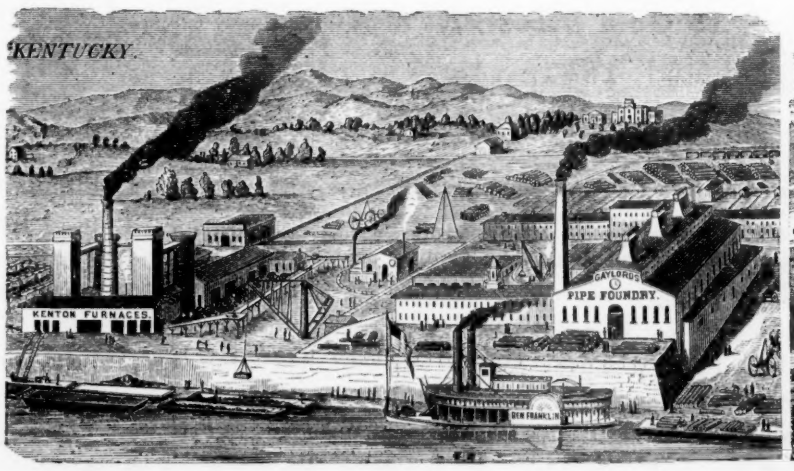

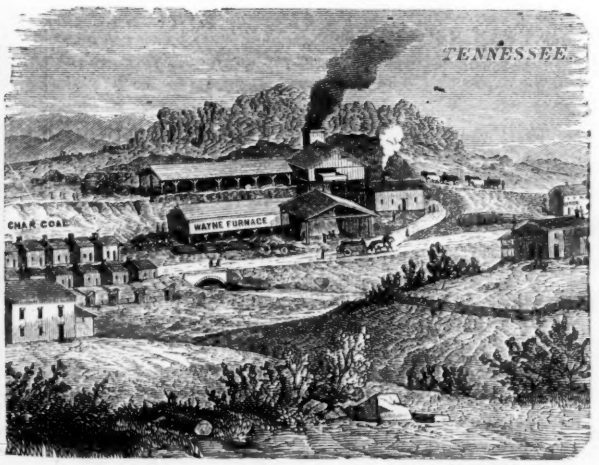

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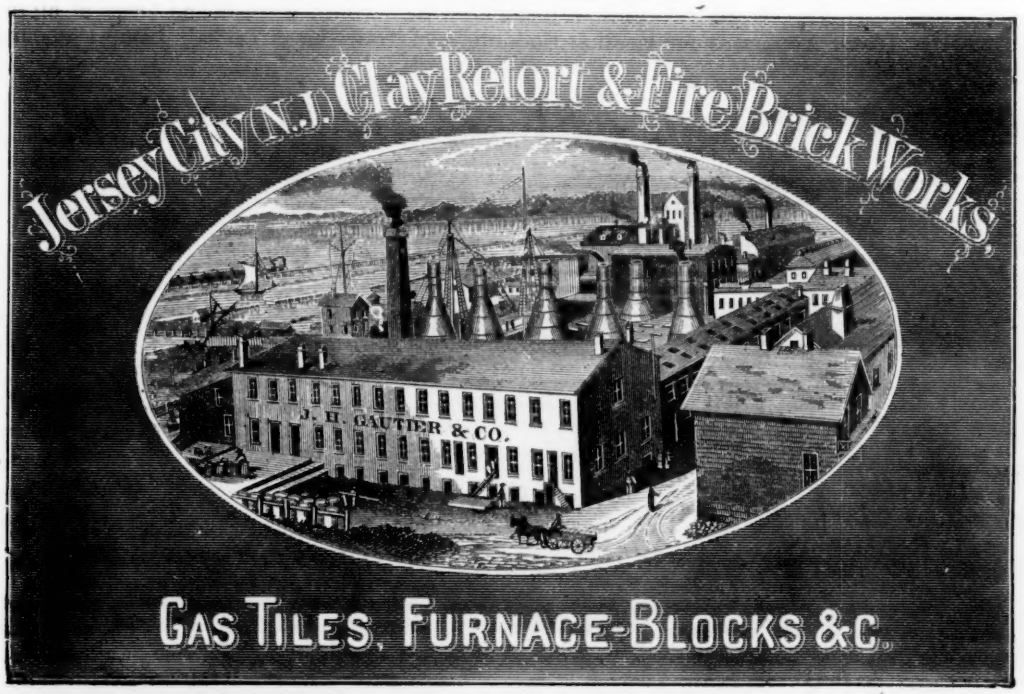

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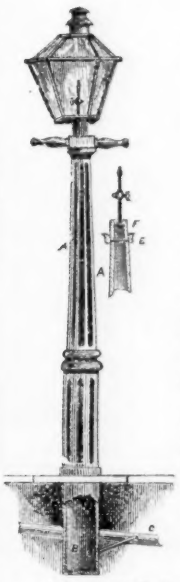
GRAHAM'S

Patent Anti-Freezing LAMP POST.



THE BEST, CHEAPEST AND MOST DURABLE POST EVER OFFERED TO THE PUBLIC.

WOOSTER, OHIO
Jan. 24, 1871.

J. W. GRAHAM,

Dear Sir: Yours of the 14th inst at hand. In reply I would say that we have tested the six anti-freezing Lamp Posts purchased from you, and find them to be all as you represented. Whilst nearly a dozen of our sixty-five Posts were frozen down last month and first of this not one of yours was affected by the heavy frost. What can you sell them at?

Yours truly,
LUCAS FLATTERY
Sec'y Wooster Gas-Light Co.

Address the Patentee,

J. W. GRAHAM,
Chillicothe, Ohio.

250-9t

THOMAS T. TASKER JR. STEPHEN P. M. TASKER.

MORRIS, TASKER & CO.,

PASCAL IRON WORKS, PHILADELPHIA.

TASKER IRON WORKS, NEWCASTLE, DEL.

Office, Fifth and Tasker Streets, Philadelphia.

Office and Warehouse, 15 Gold Street, New York.

Established 1821.

FOR GAS WORKS MACHINERY, ADDRESS OFFICE, FIFTH AND TASKER STREETS, PHILADELPHIA.

Manufacturers and Builders of Gas Works, &c., of all Descriptions, of the Most Approved Plans.

WROUGHT IRON ROOF FRAMES.—For Slate, or Corrugated Iron Coverings, with Cast Iron Cornice Gutter. Iron Doors and Frames, Wrought Iron Pivot Blinds, Windows and all kinds of Castings and Smith Work for Buildings.

BENCH CASTINGS.—Retorts, and all Castings and Wrought Iron Work required for Setting them on the Latest Plan. Tar Gates, Wrought Iron Stand Pipes, Retort Lids, Cotter Bars, Coal and Coke Wagons, and Stokers' Tools.

EXHAUSTERS.—Exhausters and Compensators, By-Passes to pass from 4,000 to 150,000 Cubic feet of Gas per hour, with Engines, Governors, Pressure and Vacuum Guages.

SCRUBBERS.—Single or Multitubular Scrubbers, with Self-Acting Pumps for Ammonia Water.

WASHERS.—Cataract and Single and Multitubular Spray Washers.

CONDENSERS.—Single and Multitubular Air and Water Condensers.

PURIFIERS.—For Purifying from 1,000 to 2,000,000 cubic feet capacity daily, with either wet or dry Lime, or Oxide of Iron, and with either Ash Rivetted or Wrought or Cast Iron Lime Sieves.

CARRIAGES.—Movable Lifting Carriages for Purifiers, arranged either for Floor or Overhead use.

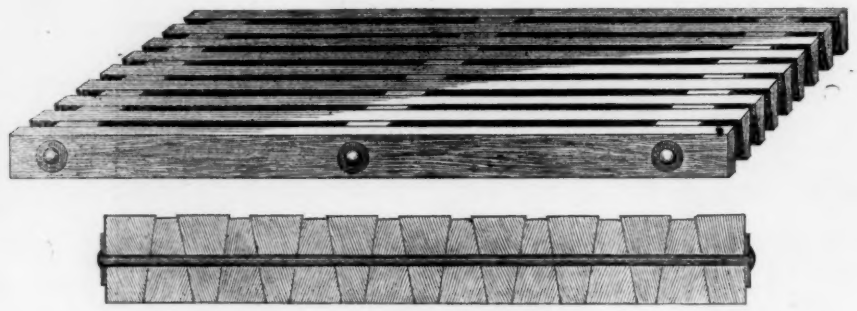
METERS.—Square and Round Meters of any capacity.

GAS HOLDERS.—Single Lift and Telescopic Gasholders, with Cast or Wrought Iron Suspension Frames.

GAS GOVERNORS.—Station Governors, with Regulating and Indicating Columns for Inlet and Outlet Pipes, also Dry Governors with Flexible Diaphragms for Underground Pipes.

STOP VALVES.—Double Faced Stop Valves for Gas or Water, from three inches to forty-eight inches diameter. These Valves are proved on both sides, with a heavy Water Pressure, Flange and Bell Pipes, Fittings and Drips of all descriptions. Steam Boilers and Hot Water Apparatus for Heating Building, and Gas Holder Tanks. Lamp Posts and Lanterns.

P. Munzinger's Patent Ash Lime Trays.



In use at the following Gas-Light Companies:

Pittsburg Gas Company, Pa.
Peoples Gas Company, Baltimore.
Lowell Gas-Light Company, Mass.
Lynn Gas-Light Company, Mass.
Albany Gas-Light Company, N. Y.
Schenectady Gas Light Company, N. Y.
Utica Gas-Light Comwany, N. Y.
Jersey City Gas Company, N. J.
St. Paul Gas-Light Company, Minn.
Cumberland Gas-Light Company, Md.
Hartford City Gas-Light Company, Conn.
Richmond Gas Company, Va.
McKeesport Gas Company, Pa.
Middletown Gas Company, Pa.
East Newark Gas-Light Company, N. J.
Binghampton Gas Company, N. J.
Zanesville Gas Company, Ohio.
New Orleans Gas Company, La.
Salem Gas-Light Company, Mass.
New Britain Gas-Light Company, Conn.
Rahway Gas-Light Company, N. J.
Trenton Gas-Light Company, N. J.
Elmira Gas Company, New York.
Erie Gas Company, Pa.
Columbus Gas-Light Company, Ohio,
Westchester Gas-Light Company, N. Y.
Santa Cruz Gas Company, Cal.
Lawrence Gas-Light Company, Kansas.
Salem Gas Company, N. J.
Indiana Gas-Light Company, Pa.
Peoria Gas Company, Ill.
Montclair Gas Company, N. J.
Williamsport Gas Company, Pa.
Wooster Gas-Light Company, Ohio.
Augusta Gas-Light Company, Ga.
Huntsville Gas Company, Ga.
Chattanooga Gas Company Tenn.
Murfreesboro Gas Company, Tenn.
Hagerstown Gas-Light Company, Md.
Hanover Gas Company, Pa.
Easton Gas Company, Pa.
Uniontown Gas-Light Company, Pa.
Coatesville Gas-Light Company, Pa.
Houston, Gas Company, Texas.
Wilkesbarre Gas Company, La.
Middletown Gas Company, New York.
Washington Gas-Light Company, Pa.
Princeton Gas-Light Company, N. J.
Newark Gas Company, Ohio.
Pontiac Gas-Light Company, Mich.
And numerous other Companies.